



Monticello Nuclear Generating Plant
2807 W County Road 75
Monticello, MN 55362

February 28, 2012

L-MT-12-013
10 CFR 50.73

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Monticello Nuclear Generating Plant
Docket 50-263
Renewed Facility Operating License No. DPR-22

LER 2011-008-01 "Reactor Scram Due to Loss of Normal Offsite Power"

A revision to the Licensee Event Report (LER) for this occurrence is attached.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

A handwritten signature in black ink, appearing to read 'Timothy J. O'Connor', written over a horizontal line.

Timothy J. O'Connor
Site Vice-President
Monticello Nuclear Generating Plant
Northern States Power Company-Minnesota

Enclosure

cc: Regional Administrator, Region III, USNRC
Project Manager, Monticello Nuclear Generating Plant, USNRC
Resident Inspector, Monticello Nuclear Generating Plant, USNRC

LICENSEE EVENT REPORT (LER)(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0066), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME

Monticello Nuclear Generating Plant

2. DOCKET NUMBER

05000 263

3. PAGE

1 OF 4

4. TITLE

Reactor Scram Due to Loss of Normal Offsite Power

5. EVENT DATE

MONTH	DAY	YEAR
10	21	2011

6. LER NUMBER

YEAR	SEQUENTIAL NUMBER	REV NO
2011	008	01

7. REPORT DATE

MONTH	DAY	YEAR
2	28	2012

8. OTHER FACILITIES INVOLVED

FACILITY NAME

DOCKET NUMBER
05000

FACILITY NAME

DOCKET NUMBER
05000**9. OPERATING MODE**

Mode 1

10. POWER LEVEL

100%

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

- | | | | |
|---|---|--|--|
| <input type="checkbox"/> 20.2201(b) | <input type="checkbox"/> 20.2203(a)(3)(i) | <input type="checkbox"/> 50.73(a)(2)(i)(C) | <input type="checkbox"/> 50.73(a)(2)(vii) |
| <input type="checkbox"/> 20.2201(d) | <input type="checkbox"/> 20.2203(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |
| <input type="checkbox"/> 20.2203(a)(1) | <input type="checkbox"/> 20.2203(a)(4) | <input type="checkbox"/> 50.73(a)(2)(ii)(B) | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |
| <input type="checkbox"/> 20.2203(a)(2)(i) | <input type="checkbox"/> 50.36(c)(1)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(iii) | <input type="checkbox"/> 50.73(a)(2)(ix)(A) |
| <input type="checkbox"/> 20.2203(a)(2)(ii) | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | <input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A) | <input type="checkbox"/> 50.73(a)(2)(x) |
| <input type="checkbox"/> 20.2203(a)(2)(iii) | <input type="checkbox"/> 50.36(c)(2) | <input type="checkbox"/> 50.73(a)(2)(v)(A) | <input type="checkbox"/> 73.71(a)(4) |
| <input type="checkbox"/> 20.2203(a)(2)(iv) | <input type="checkbox"/> 50.46(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(v)(B) | <input type="checkbox"/> 73.71(a)(5) |
| <input type="checkbox"/> 20.2203(a)(2)(v) | <input type="checkbox"/> 50.73(a)(2)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(v)(C) | <input type="checkbox"/> OTHER |
| <input type="checkbox"/> 20.2203(a)(2)(vi) | <input type="checkbox"/> 50.73(a)(2)(i)(B) | <input checked="" type="checkbox"/> 50.73(a)(2)(v)(D) | Specify in Abstract below or in
NRC Form 366A |

12. LICENSEE CONTACT FOR THIS LER

NAME

Carrie Fosaaen, Licensing Engineer

TELEPHONE NUMBER (Include Area Code)

763-295-1357

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTORER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTORER	REPORTABLE TO EPIX
C	FK	CBL	X000	Y	N/A	N/A	N/A	N/A	N/A

14. SUPPLEMENTAL REPORT EXPECTED☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE).☐ NO**15. EXPECTED SUBMISSION DATE**

MONTH

N/A

DAY

N/A

YEAR

N/A

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

At 1250 on October 21, 2011, at the Monticello Nuclear Generating Plant, a 2R Auxiliary Transformer lockout unexpectedly occurred causing off-site power to automatically transfer to the 1R Auxiliary Transformer, which resulted in a reactor scram.

One cable of the "A" phase conductor, supplying power from 2RS to 2R Transformer, faulted to ground, resulting in the 3N4 breaker opening, as designed, to protect 2RS Transformer and other equipment from fault current damage. Subsequent testing indicates the cable suffered from environmental and age-related degradation.

Implementation efforts to replace the cables between 2R Transformer and 2RS Transformer were in progress at the time of the event. A portion of the new raceway was under construction.

The cables were replaced entirely employing a route designed to avoid cable submergence in water. Subsequent to installation, cables were successfully tested and returned to service.

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Energy Industry Identification System (EIS) codes are identified in the text as [XX].

EVENT DESCRIPTION

Prior to the event Monticello Nuclear Generating Plant (MNGP) was in Mode 1 at 100% power.

Three transformers provide the plant with offsite power from the substation. All three sources can independently provide adequate power for the plant's safety-related loads. These transformers and their interconnections to the substation are as follows: The primary station 2R Auxiliary Transformer provides the plant's full auxiliary load requirements from a 345 KV Bus via underground cabling. The reserve 1R Auxiliary Transformer can provide the plant's full auxiliary load requirements and is fed overhead from a 115 KV substation. The reserve auxiliary 1AR Transformer can provide only the plant's essential 4160 Vac buses and may be fed from either of two separate 13.8 KV sources.

At 1250 CDT on October 21, 2011, a Lockout of 2R Transformer [XFMR] occurred due to a ground fault on the "A" phase of 2RS to 2R cable [FK] actuating relay 86/3N4 and disconnecting the 2R source from offsite power. Offsite power source automatically shifted from the 2R to 1R Transformer. An automatic reactor scram and Group II Isolation occurred due to low reactor water level (+9"). A partial Group II isolation occurred upon loss of power to the Spent Fuel Pool and Plenum radiation monitors [IL] which initiated Standby Gas Treatment [BH], a Secondary Containment Isolation, and the high radiation mode of Control Room Ventilation (CRV)/ Emergency Filtration Train (EFT) systems. Both 11 and 12 Emergency Diesel Generators (EDG) [DG] auto started, along with their associated EDG- Emergency Service Water pumps [P] (EDG-ESW), but were not needed as safety-related Bus 15 transferred to 1AR Transformer and safety-related Bus 16 was automatically transferred to 1R Transformer. 13 ESW pump [P] auto-started upon the transfer of Bus 15 to the 1AR Transformer. Additionally, the Suppression Pool Cooling mode of Residual Heat Removal (RHR)/ RHR-Service Water (RHR-SW) [BI] was placed into service.

During the scram and recovery, the following occurred:

- Operations identified that the 11 EDG-ESW pump P-111A [P] did not deliver the required flow rate resulting in both 11 ESW system and the 11 EDG being declared inoperable at 1325 CDT. 11 EDG cooling was transferred to Service Water and the EDG was available to perform required functions. EDG-ESW pump P-111A was replaced, Intake Structure [NN] inspected, and 11 EDG-ESW returned to service and successfully tested.
- Prior to the event, "B" trains of CRV and EFT had been removed from service for planned maintenance. With the "A" trains of CRV/EFT declared inoperable as a result of 11 EDG inoperable, both trains of CRV/EFT were inoperable, resulting in safety system functional failures. Replacement of EDG-ESW P-111A and return to service of "B" CRV/EFT corrected the problem.
- The 11 Condensate Pump [P] was unavailable due to a failure of Bus 13 to re-energize after the automatic power transfer to 1R Transformer. The 4kV Breaker [BKR], 4KVB-10, closed and then tripped free. Several attempts to repeat the condition with site breaker expertise were unsuccessful. Further investigation and forensics are currently being pursued to find the root cause with industry experts. As a result of the failure, the breaker was removed and replaced. Post maintenance testing after breaker replacement confirmed satisfactory operation.

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- 11 Reactor Feedwater Pump (RFP) [P] tripped on high reactor water level. Operations attempted a manual start of 11 RFP once the high water level cleared. A trip signal was received and a second attempt was made to manually start the pump with the same result. 12 Reactor Feed Pump [P] was then started to maintain reactor vessel level control. Investigation revealed that failure to restart was a circuit failure with the manual drywell isolation valve position indication interlock.

EVENT ANALYSIS

The event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph 10 CFR 50.73(a)(2)(iv)(B), and 10 CFR 50.73(a)(2) (v)(D) as an Event or Condition that Could Have Prevented Fulfillment of a Safety Function.

Investigation using a surge generator revealed a single damage point in one of the "A" phase cables supplying the 2R Transformer. The fault was located in an underground six-inch conduit.

Three cable segments were sent to a laboratory for physical analysis: the segment from the buried 6" conduit where the fault was located in an area subject to submergence (faulted); one segment from the vertical section of the phase in an area not subject to submergence (vertical); and one segment from the horizontal cable running in free air not subject to submergence (horizontal). The laboratory testing revealed a "dramatic difference in the quantity of water trees and degree of perforation between the cable in the conduit (subjected to past wetted and drying cycles) and cable that was not submerged suggesting that environmental degradation is a likely cause of the fault in the cable". (Water tree degradation is a commonly accepted term describing insulation degradation.)

SAFETY SIGNIFICANCE

The Probabilistic Risk Analysis (PRA) group performed a quantitative bounding PRA analysis. Conservatism in the event risk analysis include complete, immediate and unrecoverable loss of 11 EDG, and no credit for 11 Feedwater Pump or Bus 13. Existing coolant flow to the EDG from its normal source at the time of the event would have supported EDG success at full load. Supplemental cooling from Service Water was available and was successfully implemented.

The risk associated with the October 21, 2011 scram and associated deficiencies related to 11 EDG Cooling, 11 Reactor Feedwater Pump, and 13 Bus supply breaker is conservatively below the thresholds of what is considered to be low significance with regard to core damage frequency ($< 1.0 \text{ E-06}$) and with regard to large early release frequency ($< 1.0 \text{ E-07}$).

CAUSE

One cable of the "A" phase conductor supplying power from 2RS Transformer to 2R Transformer faulted to ground resulting in 3N4 breaker opening to protect 2RS Transformer and other equipment from fault and current damage. The insulation at the location of the fault had degraded such that it was unable to withstand either normal or transient conditions. Subsequent testing indicates the cable had suffered from environmental and age-related degradation.

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CORRECTIVE ACTION

A replacement project of the 2RS to 2R Transformer feed cables was in progress at the time of the unit trip. The entire 35kV feeder cable run was replaced with 750 kcmil copper cables with 133% insulation, employing a route designed to avoid cable submergence in water as part of improving the long term life cycle management of the sub-yard power feed to the site reserve 2R Transformer. Subsequent to installation, cables were successfully tested and returned to service.

PREVIOUS SIMILAR EVENTS

Licensee event report 2008-005 "Reactor Scram due to Loss of Normal Offsite Power"